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Type II Progress Report
Period December 1, 1975 to February 29, 1976

Earth Resources Evaluation for
New Mexico by Landsat - 2

(Follow-on Investigation #23370)

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NASA Contract No. NAS5-20916

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Introduction

The objective of the study is to utilize Landsat data as well as supplementary photos and maps in conjunction with field investigations to provide information that will be useful in evaluating, developing, and managing the natural resources of New Mexico. Emphasis will be placed on mineral resources, geologic structure, landform surveys, and on land-use survey and mapping.

Accomplishments

The finished statewide land-use map for New Mexico at a scale of 1:1,000,000 is being readied for publication by the New Mexico Bureau of Mines and Mineral Resources drafting staff. Color separations should be completed and color proofs ready by mid-April, 1976.

23370

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*Principal Investigator

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(E76-10226) EARTH RESOURCES EVALUATION FOR
NEW MEXICO BY LANDSAT-2 Progress Report, 1
Dec. 1975 - 29 Feb. 1976 (New Mexico State
Bureau of Mines and Mineral) 4 p HC \$3.50

Final arrangements have been made with the Los Alamos Scientific Labs to use their computer facilities and digital data tapes to study the utility in mineral fuel exploration of contrast stretched and ratioed images of the San Juan Basin. A voluminous literature search, contacts with people doing related studies, and minor field work was done to choose four test site areas and parameters for enhancement involving image E142517193 taken September 21, 1973. Data products to be provided by Los Alamos will be black and white photos of simple contrast-stretched ratios $5/4$, $6/4$, $7/4$, $4/7$, and $4/5$ plus two color composites of contrast-stretched ratios with $5/4 = \text{blue}$, $6/4 = \text{green}$, and $4/7 = \text{red}$ plus $4/7 = \text{blue}$, $6/4 = \text{green}$, and $7/4 = \text{red}$. These products should be ready by mid-April and work will begin then on image interpretation to try and delineate anomalous areas associated with petroleum and uranium deposits.

Significant Results

A statewide land-use map has been compiled from Landsat color transparencies and field checked for accuracy and vegetation and terrain correlation with Landsat classified areas. This map is in the process of being published.

Publications and Talks

No papers have been published or talks given during this reporting period.

Landsat and Aircraft Imagery

We have received complete Landsat coverage of the State of New Mexico of fair to excellent quality taken on two to four different dates. We have ordered and received color composites covering 96% of the state.

Data Use

	Landsat Acct. #G23370	Aircraft Acct. #GW3370
value of data allowed	\$5300	\$1045
orders received	<u>\$2388</u>	<u>\$ 664</u>
balance	\$2912	\$ 381

Selected references for exploration study of San Juan Basin
mineral fuels.

- 1) Spirakis, C. S. and Condit, C. D., 1975, Preliminary report on the use of Landsat-1 (ERTS-1) reflectance data in locating alteration zones associated with uranium mineralization near Cameron, Arizona, U. S. Geol. Surv. Open-file report 75-416, 20 p.
- 2) Kelley, V. C. et al., 1963, Geology and technology of the Grants uranium region, N. M. Bureau of Mines and Mineral Resources Mem. 15, 277 p.
- 3) Chapman, Wood, and Griswold, 1974, Geologic map of Grants uranium region, N. M. Bureau of Mines and Mineral Resources GM-31, 3 sheets.
- 4) Donovan, T. J., 1974, Petroleum microseepage at Cement, Oklahoma: evidence and mechanism, Am. Assoc. of Petroleum Geol. Bull. 58, n. 3, p. 429-446.
- 5) Donovan, T. J., 1975, (abs.) Landsat data contributions to project BIRDDOG, First Annual Wm. T. Pecora Symposium, Sioux Falls, South Dakota.
- 6) Donovan, T. J., et al., 1975, (abs.) Low-altitude remote sensing experiments at Cement and Davenport oil fields, Oklahoma, Proc. 45th Ann. Mtg. Soc. of Exploration Geophys., Denver, Colorado, p. 68.